m i c r o f l i g h t

ARINC AEEC ADN WG 664

NASA GLENN

Integrated CNS Conference

Tyson Corner

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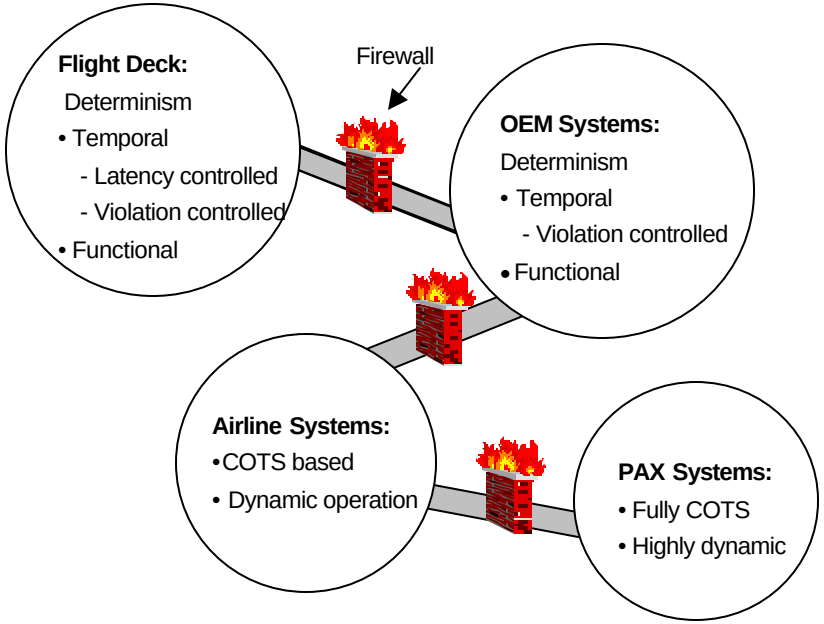
ADN WG 664 Objectives

- Identify commercial network standards that may be applied to Aircraft Networks
  - Commercial Network Standards have been used in Commercial Aircraft for a number of years
  - 664 is the first standard to use Commercial Network Standards as a reference and identify the aviation deviations (e.g. IEEE 802.3 Ethernet & IETF RFC 1122 IP)

Background

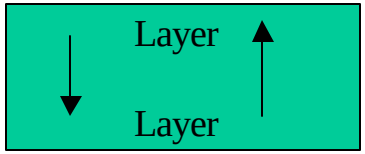
- WG 664 Started with IEEE 802.3 and RFC 1122
- Airframers Boeing & Airbus along with Avionics companies Smith Industries Sextant Avionic, Rockwell and Honeywell collaborated to create Project Paper 664
- The goal was established to allow for connection of different airborne networks on-board aircraft

ARINC 664 Aircraft Data Network Domains

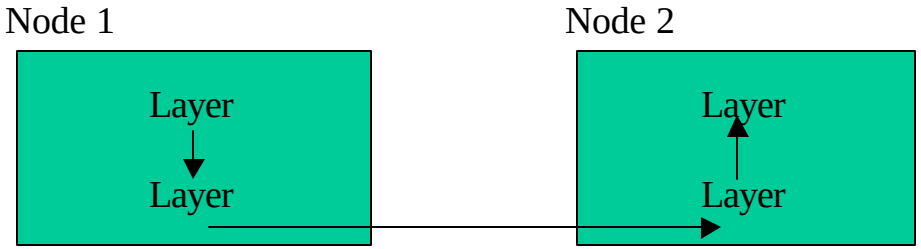


664 Fundamental Perspectives

- Network includes applications and systems that use the network for communication
- Services are basic operations provided by network layer to adjacent layers



- Protocols are a set of rules for formatting messages exchanged between peer layers and implemented by Services



664 Fundamental Perspectives (Cont.)

- Network characteristics include Compliant Networks that comply with IEEE 802.3 and RFC 1122, and Profiled Networks that deviate from IEEE 802.3 and/or RFC 1122 to achieve certain aviation required objectives
- Interoperability is considered for both existence dissimilarities and implementation
- Service and Protocol Implementation Conformance Statements (SICS & PICS) provide for comparison of network services and protocols for compliant and profiled networks.

So What Makes 664 Unique?

- 664 provides guidelines for selecting internet protocols and services for aviation compliant and profiled networks.
- Profiled networks recognized the aviation need for multiple networks on-board the aircraft with differing levels of:
  - Integrity
  - Availability
  - Certitude,
  - Security
  - Safety

So What Makes 664 Unique? (Cont.)

- Communication among and between networks exists giving rise to interoperability concerns
  - Existence dissimilarities – service provided in one domain but not in in another
  - Implementation Dissimilarities – service provided in one domain but implemented differently in another domain
- Concerns are reduced or eliminated by use of SICS & PICS

664 WG Process

- It is consensus based
- Use of Standards Ethernet and Internet protocols sped the consensus process
- Use of open standards has encouraged entry of other companies who already use the open standards

What's next for 664?

- Security (Part 5)
- Network Management Protocols (Part 6)
- Documentation of an implementation (Part 9 AFDX)
- Testing and Reference Plane (Part 2)
- Drafts of 664 documents may be reviewed at:

  http://www.arinc.com/aeec/draft_documents/
- 664 Part 1 may be reviewed at:

  http://www.arinc.com/aeec/draft_documents/01-174.pdf